



**Australian Government**  

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**Commonwealth Grants Commission**

**NEXT REVIEW**

**MEASURING SOCIO-ECONOMIC STATUS**

**STAFF DISCUSSION PAPER**  
**CGC 2012-03**

**August 2012**

Paper issued	1 August 2012
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Comments sought by	For discussion at Data Working Party meeting on 30 August 2012.  Written comments should be emailed in Word format to <a href="mailto:secretary@cgc.gov.au">secretary@cgc.gov.au</a> .
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## SUMMARY

- 1 People of different socio-economic status (SES) make very different use of government services, and the States' shares of people of low SES varies markedly. Therefore an assessment of SES is highly material.
- 2 The most viable approach to assessing SES is to use the ABS socio-economic index for areas (SEIFA), and while a number of criticisms have been made of this indicator, these are largely unfounded, and SEIFA should be considered a reliable and robust approach to assessing socio-economic status.

## BACKGROUND

- 3 In the 2010 Review, the Commission used the ABS's Socio-Economic Indexes for Areas (SEIFA) Index of Relative Socio-economic Disadvantage (IRSD) in four assessments - Schools education, Admitted patients, Community and other health and Justice services. It was used as an indicator of the prevalence of disadvantaged people in a State and allowed us to recognise the higher costs incurred by States in providing services for these groups.
- 4 The Commission used the number of Commonwealth pension beneficiaries in the Welfare and Housing assessment as an indicator of SES and the number of Commonwealth concession card holders in the Services to Community assessment as an indicator of the number of water and electricity subsidies required because of disadvantage. These were considered better indicators of State expense requirements in those categories.
- 5 In the 2012 Update, socio-economic factors were responsible for redistributing \$914 million of GST revenue (Table 1).

**Table 1** GST redistribution due to socio-economic status, 2012-13

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Redist
\$m	252	40	-181	-446	432	191	-163	-124	914
\$pc	34	7	-39	-189	260	372	-443	-530	40

Source: Commission Calculation

### What is socio-economic status

- 6 People of low socio-economic status tend to use public health services more than people of higher socio-economic status. It is worth considering whether this is a direct result of their generally lower incomes, or due to a broader social phenomenon. In countries with absolute poverty, where low incomes directly prevent people from accessing balanced nutrition and medicines, income may be a direct cause of health status.

- 7 However, in Australia, this does not appear to be the primary driver of the relationship. For example, the rate of smoking is much higher among the most disadvantaged. However it is not the financial capacity of the poor that lead them to having much higher rates of smoking. Rather, it is a much more complex relationship between various economic and social phenomenon. It is this concept that we attempt to measure through socio-economic status.
- 8 In this paper we consider which concept of socio-economic status can best explain the use of State government services, recognising that different measures may be more appropriate for some services. This paper does not suggest that only one measure of SES should be employed. If there is a direct relationship between the criteria States use to determine eligibility for a service, and a policy neutral measure of the numbers of people eligible, then the direct measure should be adopted. However, in the absence of a direct relationship, we consider what measure of SES best correlates with differences in State service provision.

## **POSSIBLE MEASURES**

- 9 This section examines the possible indicators that staff have considered for use as a measure of socio-economic status. The indicator should:
  - reflect the underlying concept of socio-economic status
  - have a strong relationship with service use
  - allow the distribution of SES across States to be measured.
- 10 Table 2 shows the relative level of SES disadvantage of States suggested by a range of potential indicators. The levels for each State vary fairly markedly between indicators. This variability in relative positions of the States on different indicators may be cause for concern. However, most of the difference can be attributed to differences in age structure between the States. Because different aspects of disadvantage are more pronounced in different age groups, the relative levels of disadvantage fluctuate.
- 11 For the Northern Territory, however, the driver of the very different levels of disadvantage is due to heterogeneity of the Territory. Indigenous people make up about a third of the population, and are among the most disadvantaged Indigenous people in the country. The non-Indigenous people, on the other hand, are among the least disadvantaged in the country. The non-Indigenous people in the Northern Territory have levels of disadvantage at about half the national average rate for non-Indigenous people: a level comparable with the ACT.
- 12 With such a heterogeneous population, small differences in the Indigenous share of each indicator can lead to very different results.

- 13 Measuring the relative level of people in the bottom SEIFA quintile will produce very extreme results, with only 13% of the national average level in the ACT, but 165% in Tasmania. The reasons for this exaggeration are described from paragraph 34.
- 14 The level of disadvantage measured by the SEIFA (SEIFI weighted) approach, which is conceptually similar to the approach applied with other indicators, gives results broadly in line with other indicators.
- 15 In selecting an indicator, we should reflect on which measure best reflects the level of disadvantage that affects use of States services. Given that for most States, the differences are relatively small, and there is no objective gold standard against which to compare, this approach to selecting an indicator is difficult unless we have data showing the relationship between service use and each indicator.

**Table 2 State distribution of selected socio-economic indicators**

	Relative levels								National proportion
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	
	%	%	%	%	%	%	%	%	%
Low Equivalised Household income (a)	100	99	102	89	113	132	47	97	17.3
Commonwealth pensioners	103	100	97	82	121	135	58	79	20.2
SEIFI bottom quintile	99	94	100	95	117	141	60	164	25.8
SEIFA (SEIFI weighted) (b)	103	96	98	92	111	129	62	112	25.8
SEIFA bottom quintile	111	87	94	75	129	165	13	186	20.0
Other census based indicators									
Low skilled occupations (c)	95	96	109	104	109	114	65	115	26.4
One parent families with dependents	100	95	104	95	104	114	93	124	7.9
Divorced or separated	98	94	107	103	105	112	97	105	11.3
Unemployed	111	104	92	75	97	119	74	87	3.4
Renting government housing	105	86	75	98	166	160	183	101	14.4
Did not go to school	122	127	53	74	88	40	46	240	1.0
No post-school qualifications	96	100	105	99	108	110	76	104	51.4
Under 70 and need long term help	100	98	103	86	115	129	78	82	2.5
Paying weekly rent <\$120	86	88	87	127	147	183	83	279	18.5
No internet connection	97	98	100	97	114	127	64	155	29.2
No motor vehicle	122	89	89	71	95	85	66	287	6.5

(a) 2<sup>nd</sup> and 3<sup>rd</sup> deciles: Equivalent to \$13 000 to \$21 000 for a household of 2 adults and 2 children.

(b) Estimated number of people on bottom SEIFI quartile calculated as the total population in all SEIFA quintiles weighted by the national proportion of bottom SEIFI quartile in each SEIFA quintile.

(c) Occupations included are Community and personal services workers, Machinery operators and drivers and Labourers.

Note: Relative levels are the proportion of the State population in each category divided by the national proportion.

Source: Census

## **Household Income**

- 16 Household income is a direct measure of the capacity of people to purchase goods and services. It is the most commonly used single indicator of disadvantage. It is particularly insightful when equivalised (this allows for differences in household composition — a person living alone on \$50,000 a year is likely to be better off than a family of 5 on \$50,000 a year).
- 17 Household income is, however, only one dimension of SES. It does not tell us about the household's asset status, its educational background or employment status. All these can have different impacts on service use and cost.
- 18 A main drawback to using household income is that it is not readily available in our administrative datasets. We cannot readily measure the use of hospital admissions or arrest rates by people in different income groups, because it is not captured as part of the administrative arrangements. The number of people in different income groups is available from the census but the relationship between this and service use cannot usually be established.
- 19 There is a very high level of non-response to this question in the census (and in many household surveys). 11% of the population live in households where one or more members of the household did not state their income, and so total household income could not be derived. Another 9% of the population spent census night away from home, or in non-private dwellings such as hostels, prisons or hospitals could not have household income derived.
- 20 In previous reviews, we have found a relationship between household income and service use in some ABS surveys. These data were often then combined with administrative data to create an assessment. In the interests of simplification, in the 2010 review, we avoided this approach. However, household income is an important dimension of SES and may be a relevant indicator if income is the prime determinant of access to services.

## **Commonwealth pension and benefit recipients**

- 21 People on commonwealth pensions and benefits tend to be of low income, and often have other measures of disadvantage. This is a good indicator of the impact of SES on service use in the Welfares services assessment because some 80-90% of users of welfare services are on Commonwealth pensions or benefits. To use this as an indicator of disadvantage in assessments other than welfare would require data on the use of services such as hospitals and arrests. This is not readily available.
- 22 In addition to this, the welfare assessment indicates that people on different pensions and benefits have very different levels of disadvantage. Non-Indigenous people on parenting payment (partnered) attract \$191 per person in Welfare spending, while those on Carer allowance (Child) attract \$10 472. Such differences

highlight that a simple measure of socio-economic status based on whether people receive a pension or benefit or not is too broad an indicator to be of use in most assessments.

### **Socio-economic Index for Individuals (SEIFI)**

- 23 The ABS has produced a composite socio-economic index for individuals. This measure takes account of income, education, occupation and a range of other indicators to determine the socio-economic status of individuals.
- 24 This has a benefit over household income in that it measures a more complete picture of socio-economic status, rather than just income. Because many of the indicators of socio-economic status relate to unemployment or skill level of job, it is only produced for people aged 15-64. Each individual in the census of these ages is given a SEIFI score. It is therefore possible to measure the relationship between socio-economic status and any other variables in the census (including geography). It cannot readily be used to measure use rates from administrative sources, or even from ABS surveys.

### **Socio-economic Index for Areas (SEIFA)**

- 25 SEIFA is a broad measure of socio-economic status based on areas. It is calculated using census data to create a composite index based on the proportion of the population in an area meeting various criteria for disadvantage.
- 26 While not measuring the SES of individuals concerned, it is based on the observation illustrated in Figure 1 that people living in high SES areas are generally of higher socio-economic status than those living in low SES areas.

**Figure 1 Images from areas with high and low SEIFA scores**

Castlecrag, Sydney :  
Among highest SEIFA scores



Moonee Valley, Melbourne :  
Among lowest SEIFA scores



Source: ABS SEIFA and Google Maps.

- 27 This has a number of key advantages over other measures. Firstly, it is almost universally applicable. Less than 0.6% of the population live in a handful of CDs which cannot be appropriately allocated a SEIFA score. Secondly, it is almost universally available: SEIFA is available for all geographic areas and so can be matched with



service users from most administrative sources and surveys which record the location of the user.

## **Conclusion**

- 28 All potential measures capture some aspect of socio-economic status, and all have drawbacks that make them somewhat problematic for assessing relative fiscal capacity of the States. These are summarised in Table 3. On balance, staff consider that SEIFA generally remains the best placed general measure for the Commission's work. It:
- measures more than one dimension of disadvantage
  - by using 5 quintiles, it affords a degree of subtlety to measuring SES that is not afforded by the binary variables such as government pensioner/beneficiary.
  - can be matched with service use data in administrative datasets and surveys.
  - captures the strong relationship between SEIFA and service use
  - is widely used in social research and is well understood.
- 29 Other individual measures could be adopted in particular categories if they better reflect the key elements of disadvantage most relevant in that category. For example, commonwealth pension and benefit recipients cannot readily be used as a general indicator, but it may be appropriate where use data exists, such as in the welfare assessment. Similarly, if a program were means tested, it may be more appropriate to use an income measure rather than a broader measure of socio-economic status.

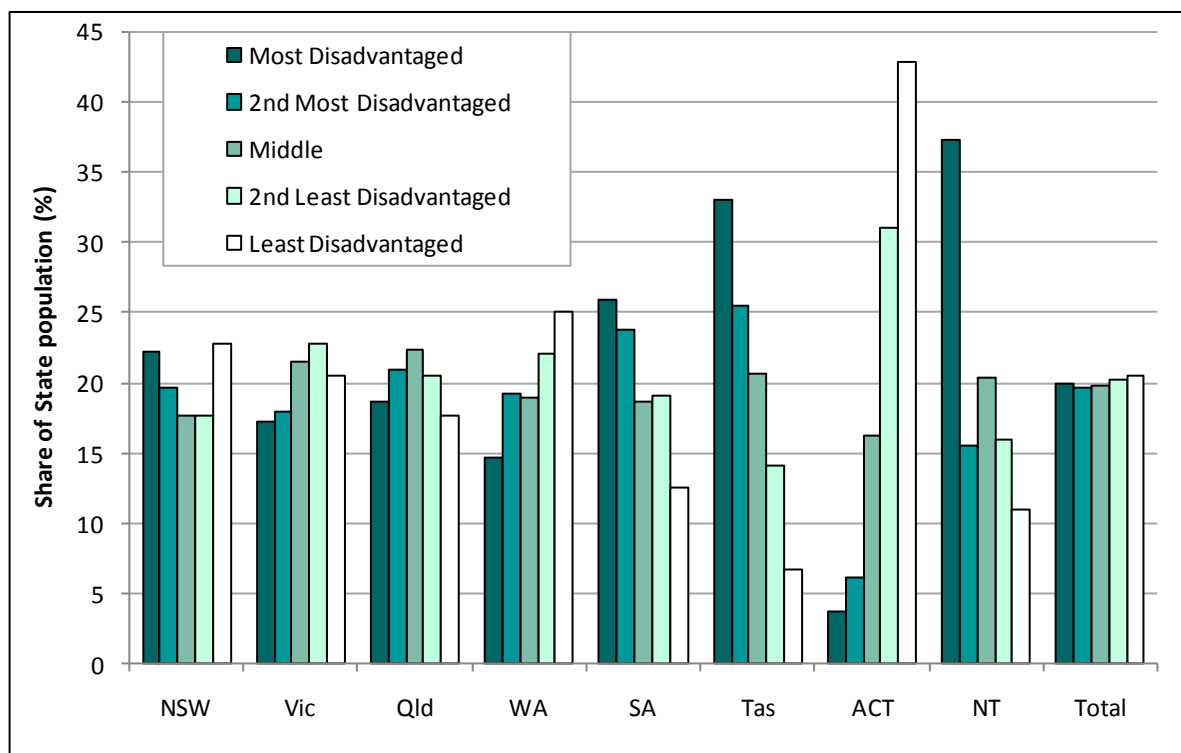
**Table 3 Summary of issues for potential measures of Socio-economic status.**

	Household income	Commonwealth pension and benefit recipients	SEIFI	SEIFA
Information on service use	Few administrative systems. Survey data would be required.	Some admin systems in some states. Survey data would be required.	No data, even from surveys.	Widely available for most admin or survey data.
Appropriateness as indicator of SES	Captures a limited aspect of SES, but does so well.		Probably the ideal measure	A fairly high quality measure.
Quality of population data	High not stated rate	Admin systems have fairly high not state rates		Place of residence is generally high quality
Simplicity	Very simple concept	Selection of specific pensions may make this relatively complex	Quite complex.	Complexity done by ABS, simple for us. Widely used and accepted.

**FEATURES OF SEIFA**

- 30 The ABS produces four different SEIFA indexes, each with a different focus on socio-economic status. These are discussed in Attachment A, which concludes that the Index of Relative Socio-economic disadvantage (IRSD) is most appropriate for our purposes. On this basis, throughout this paper we use the term SEIFA to refer specifically to the IRSD index.
- 31 Figure 2 shows the distribution of the population as at June 2008 by SEIFA quintiles

**Figure 2 Estimated resident population by SEIFA quintiles by State, June 2010**



Source: ABS Estimated Resident Population

### CONCERNS WITH SEIFA

- 32 In previous reviews, we have measured the impact of socio-economic status, using person level indicators, such as income. In the 2010 review, we adopted SEIFA as the primary measure of socio-economic status across a range of categories.
- 33 Staff and some States have identified concerns about the use of SEIFA:
- A State’s share of people in most disadvantaged areas does not reflect its share of most disadvantaged people. The reason for this can be illustrated with an analogy. In an election, the share of votes that a party gets is not necessarily comparable with the share of seats that it gets. Similarly, the proportion of low SES CDs in a State is not necessarily reflective of the proportion low SES people in that State. We have called this the electoral conundrum.
  - The population in areas of concentrated low socio-economic status may be a reflection of State government policies on the placement of public housing. States with concentrated public housing estates may have more low SES areas, just as a result of this policy choice.
  - The perceived assumption that all people in a low SES area have the socio-economic status of that area (this is known as the ecological fallacy).

- As Indigenous people represent a small proportion of the population in most CDs, using the SEIFA score of the CD assumes that the socio-economic status of the general population is reflective of the socio-economic status of the Indigenous people in that area. This is known as the 'tyranny of the majority'.

### The 'electoral conundrum' effect

- 34 The SEIFA index summarises the characteristics of people and households within an area, and thus the SEIFA score reflects the group of people as a whole. An area can be quite diverse and contain both high income and low income households so that the extent of disadvantaged people in a community as reflected by the SEIFA rankings can be masked by the distribution of disadvantaged people throughout the community.
- 35 The situation is akin to voting patterns at elections where a party may be underrepresented on a seat by seat analysis but is well represented when measured on a whole of State basis. In the 2010 federal election, in Western Australia the ALP received 44% of the two party preferred vote, but only won 26% of booths and 20% of seats. Conversely, in Tasmania, the ALP received 61% of the two-party preferred vote, and won 85% of booths and 100% of seats.
- 36 We have modelled the electoral conundrum effect using a range of different census based socio-economic indicators, showing:
- the percentage of the State's population that meet the criteria, and
  - the percentage of the State's population that are in census districts (CDs) with a high proportion of people that meet the criteria.
- 37 **Income distribution.** Low household equivalised income is a key measure of disadvantage used by the ABS.
- 38 On average, 17 per cent of people lived in low income households (this is based on the criteria used by the ABS in deriving SEIFA), and 17 per cent live in low income CDs (for how this is defined, see Attachment B). These concepts are defined to have the same proportions nationally, but State level differences can be significant.
- 39 Table 4 shows that while in the ACT 8% of the total population were in a low income household (47% of the 17.3 national average), only 0.3% of the population lived in low income CDs (2% of the 17.3% national average). In comparison, in Tasmania, 23% of the State population lived in households that had a low household income (132% of the 17.3% national average). But 37% of the State's population lived in low income CDs (216% of the 17.3% national average).
- 40 States with above average levels of low income tend to have considerably higher levels of people in low income CDs, while States with below average levels of people in low income households tend to have considerably lower levels when this concept is measured at the CD level.

- 41 This pattern of CD measured indicators exaggerating the differences between States exists not only for low income, but for a range of indicators of disadvantage that are used in the creation of the SEIFA index (see Table 4).

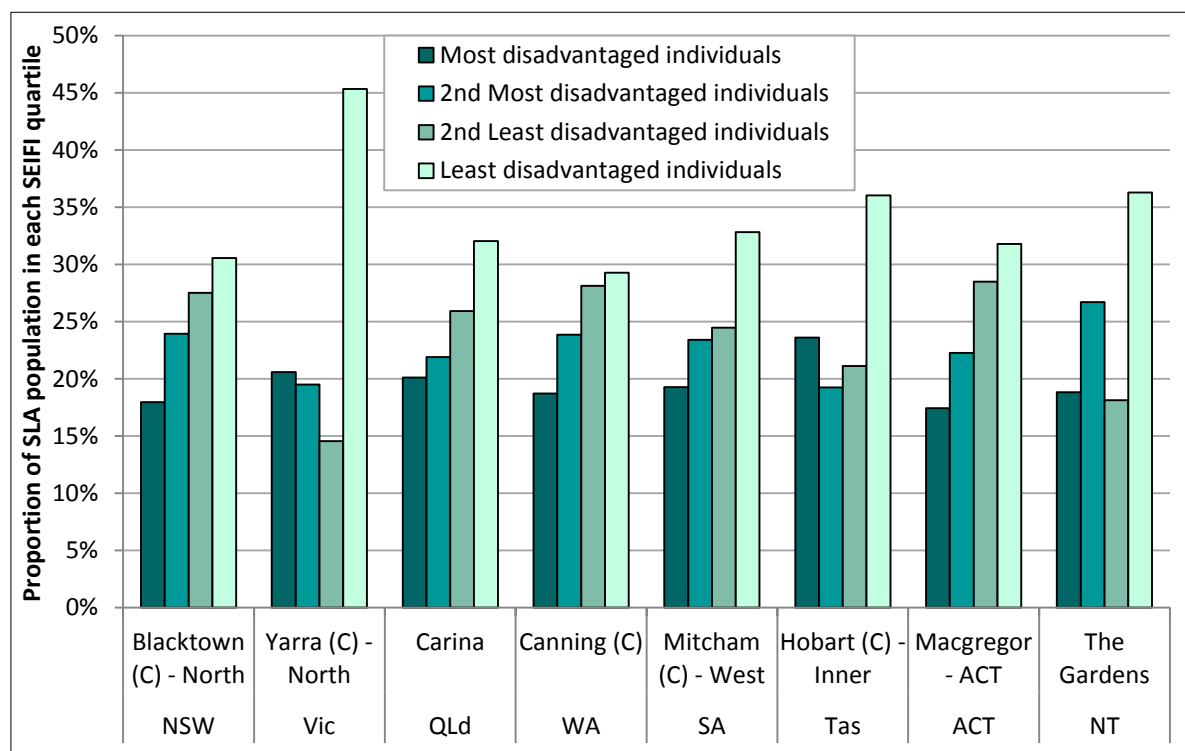
**Table 4 State-wide estimates versus collection district based estimates**

	Relative levels								National Proportion
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	
	%	%	%	%	%	%	%	%	%
<b>Low income</b>									
Individual based	100	99	102	89	113	132	47	96	17.3
CD based	109	88	104	59	133	216	2	103	17.3
<b>Unemployment rate</b>									
Individual based	111	104	92	75	97	119	74	89	3.4
CD based	156	92	44	26	100	221	58	124	3.4
<b>Divorce</b>									
Individual based	98	94	107	103	105	111	97	105	11.3
CD based	94	66	136	111	118	143	62	113	11.3
<b>Low skill occupation</b>									
Individual based	95	96	109	104	109	114	65	115	26.4
CD based	91	90	116	103	129	154	7	105	26.4

- 42 **What drives the ‘electoral conundrum’ effect?** The electoral conundrum is caused simply by the aggregation of individuals into larger units. We can consider the impact of simply randomly grouped 200 households from within a State and calculated the SEIFA score of this grouping of people, without any geographic basis.
- 43 In this hypothetical, a State such as the ACT with relatively few disadvantaged people would have even fewer groupings of people where the average disadvantage was high. Tasmania, where the number of disadvantaged people is above the national average, would have more groupings with a high average disadvantage.
- 44 In addition to this basic principle, we also find that the groupings to CD are not random, but that people have a propensity to locate close to other people of their SES. This propensity to cluster is driven by two issues: labour market issues and ‘real estate issues’:
- Labour market issues mean that a depressed region with declining unskilled industries will have more people with low SES than a booming region with a high skilled labour force. If NSW has a high skilled labour market in Sydney, and depressed rural regions with high unemployment or unskilled jobs, then it will have greater concentration of SES than the ACT which has a single labour market.

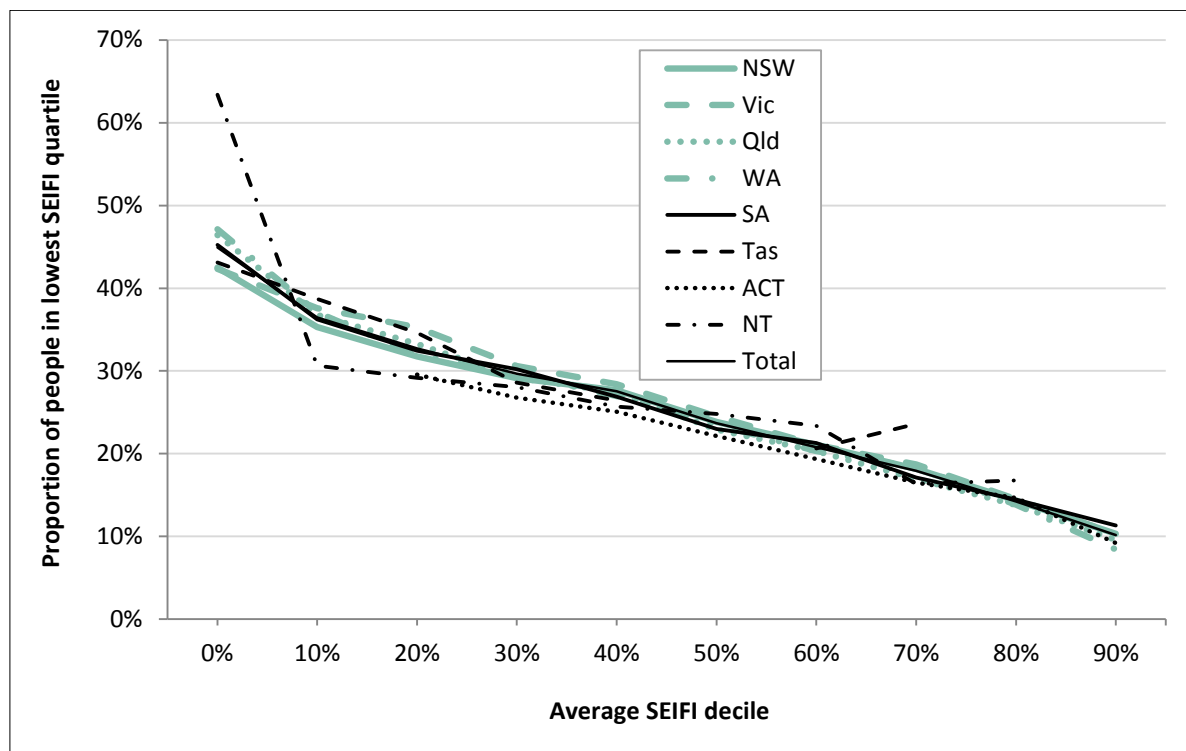
- Real estate issues relate to the social tendency to locate in areas close to other people of their SES. People tend choose to live in the nicest neighbourhood they can afford. The strength of this tendency may vary between States.
- 45 While the extent of the electoral conundrum may vary from State to State, it exists everywhere. The greater the divergence from the national average, the greater it will tend to be.
- 46 **Is the Electoral Conundrum a problem?** While the electoral conundrum is a real phenomenon, it relates to the mismatch between area and person level information. If we were applying person level use rates to an area level distribution then we would be producing bias in our approach. However, because we are applying area level use rates to area level population data, staff consider that it does not create any bias in our assessments.
- 47 While a higher proportion of ACT's poor live in relatively affluent suburbs, the profile of each suburb is quite close to the national average. Figure 3 shows the SEIFI profile of a sample of suburbs with comparable average SEIFI scores. Macgregor, in the ACT, has a similar profile to Carina in Queensland, and similar average SEIFI scores. Applying the same use patterns to both these SLAs is appropriate. The electoral conundrum comes about because Macgregor is more disadvantaged than most other ACT SLAs, while Carina is more advantaged than most Queensland SLAs. However this is not what drives the assessment.

**Figure 3 SEIFI profiles of capital city SLAs nearest 30<sup>th</sup> percentile (from top)**



48 If the profiles in Figure 3 were all similar, then applying the national average use rate for such SLAs to all SLAs with that average score would be appropriate. While Figure 3 showed that not all SLAs with comparable average SEIFI scores have identical distributions, Figure 4 shows that on average, across the population, the patterns are relatively similar. Around 45% of population in the most disadvantaged SLAs are among the most disadvantaged individuals, while only around 10% of the population in the least disadvantaged SLAs are. The Northern Territory does have a slightly different pattern, especially in the very bottom 2 deciles. The ACT does also have slightly fewer disadvantaged people than other States in comparable SLAs.

**Figure 4** Proportion of people in most disadvantaged SEIFI quartile, by Average SEIFI decile



49 It is difficult to measure whether these differences are material or not. Within the Admitted patients assessment, it is possible that the current assessment approach over-funds the ACT by around \$50 per capita, and under-funds the Northern Territory by a similar amount. No other State is materially affected. However:

- there are a many assumptions that need to be made to make such an estimate
- we have not identified how we could make an adjustment for this issue
- it is not clear what the underlying reason for this difference is, and whether such a reason is assessed elsewhere.

While it may be possible that there is a material error that comes from our assessment using SEIFA, staff do not consider any possible error to be of a sufficient size to warrant either a judgement based or complex adjustment.

### Impact of government housing policies

50 People who rent government provided housing are usually of low SES, and location of government-provided housing is determined by governments. It is therefore possible that the distributions of low SES people are influenced by government housing policies.

51 State policies to concentrate public housing could increase a State's number of low SES CDs.



- 52 If we repeat the analysis done on low incomes shown in Table 4, but exclude people living in public housing, we get a very similar result (see Table 5). For example, the greater concentration of people in low income areas in Tasmania is still evident if we exclude those in public housing.
- 53 The distribution of public housing does not appear to have a major effect on the concentration of disadvantage.

**Table 5 Impact of government housing on distribution of low income households**

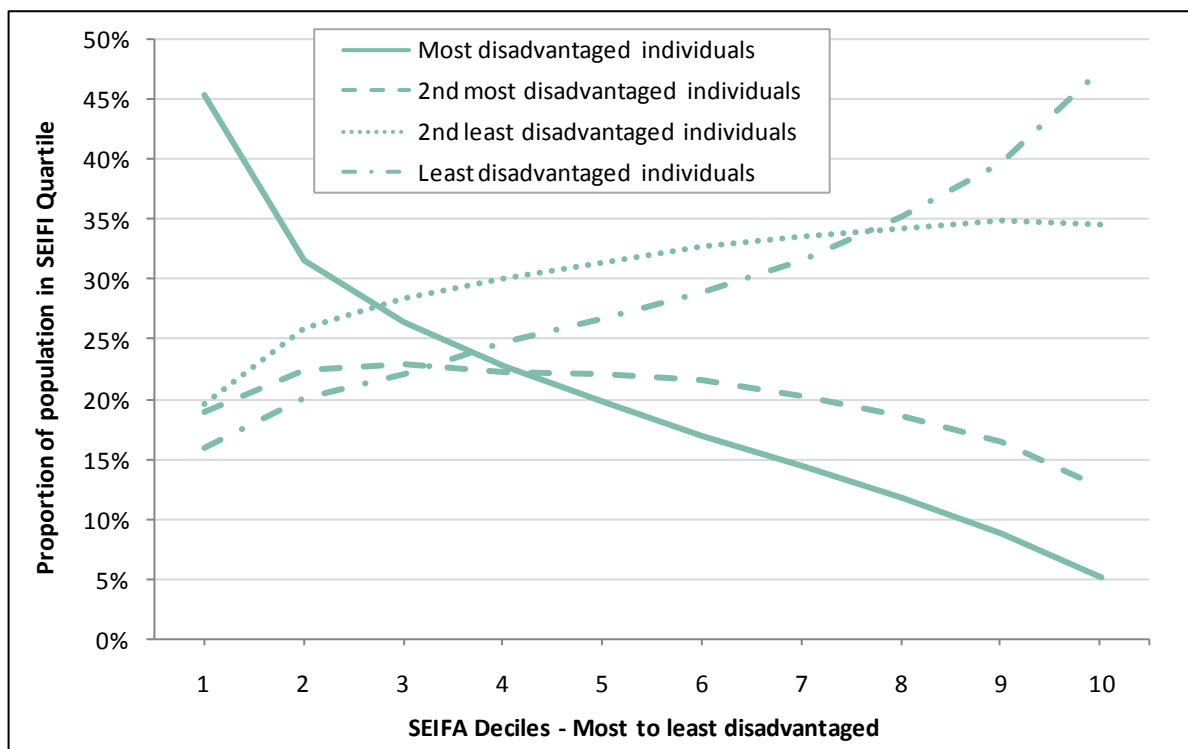
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
	%	%	%	%	%	%	%	%	%
<b>All Households</b>									
Population with low income	17.2	17.1	17.5	15.2	19.5	22.7	8.0	15.9	17.2
Population in low income Collection districts	18.6	15.0	17.8	9.9	23.0	37.4	0.3	18.0	17.2
<b>Excluding households renting from government</b>									
Population with low income	16.6	16.7	16.9	14.6	18.7	22.1	6.4	14.9	16.6
Population in low income Collection districts	17.9	15.1	17.3	9.6	20.8	36.8	0.3	18.1	16.6

### False positives and negatives

- 54 There are some people who are relatively affluent who live in disadvantaged areas, and there are people, (including people in public housing, people who may have inherited property, and those who have had major changes in life circumstance), who are very disadvantaged, but who live in the least disadvantaged areas.
- 55 Using SEIFA as a measure of individual socio-economic status does have a level of false positives and false negatives. Figure 5 shows that in the bottom SEIFA decile, 16% of residents are actually among the least disadvantaged groups of individuals. Similarly, in the CDs comprising the least disadvantaged SEIFA decile, 5% of the population are among the most disadvantaged.
- 56 There is an obvious relationship, with more disadvantaged people in the more disadvantaged areas, but the relationship is not perfect, and has false positives and false negatives. For some people, this is seen as a fundamental flaw in the use of SEIFA as a measure of individual attributes.
- 57 However staff consider that this is no different from any other proxy that we use. For example, we use household income as a measure of capacity to obtain goods and services. As such a measure, it is imperfect. It does not take account of accumulated wealth or debt; the relative cost of living in different areas; and access to non-market goods and services. Because of factors such as these, some people with high incomes may not have a high ability to obtain goods and services, and some people with low incomes may have a high capacity.

- 58 In all our assessments, we use a broad statistically available measure to classify people. In all cases this process is simplistic and does not capture the complexity of human life. Despite that, and despite the existence of false positives and negatives in any classification, the broad pattern which it attempts to proxy is generally appropriate.
- 59 So, the mere existence of false positives and false negatives does not invalidate the use of a proxy indicator. However, if the level of false positives and negatives were deemed to be high, then SEIFA could not be regarded as an appropriate proxy of the underlying socio-economic status of the population. Staff are not concerned by the quality of SEIFA on these grounds.
- 60 SEIFA, as an average score represents a distribution of scores. It does not purport that all people in an area have the same socio-economic status, it merely purports that the mix of socio-economic groups in areas with similar average scores is similar. The existence of low SES people in high SES areas is not problematic for the way we have applied SEIFA in our assessments.

**Figure 5 Socio-Economic indexes for areas and for individuals**



**Indigenous people and the ecological fallacy**

- 61 Staff have also considered concerns that using general population area-based measures for socio-economic status such as SEIFA rankings may not be suitable in areas where there are small sub-groups of populations that have characteristics that

may be quite different from the overall population they live among. This can be especially relevant for Indigenous people<sup>1</sup>.

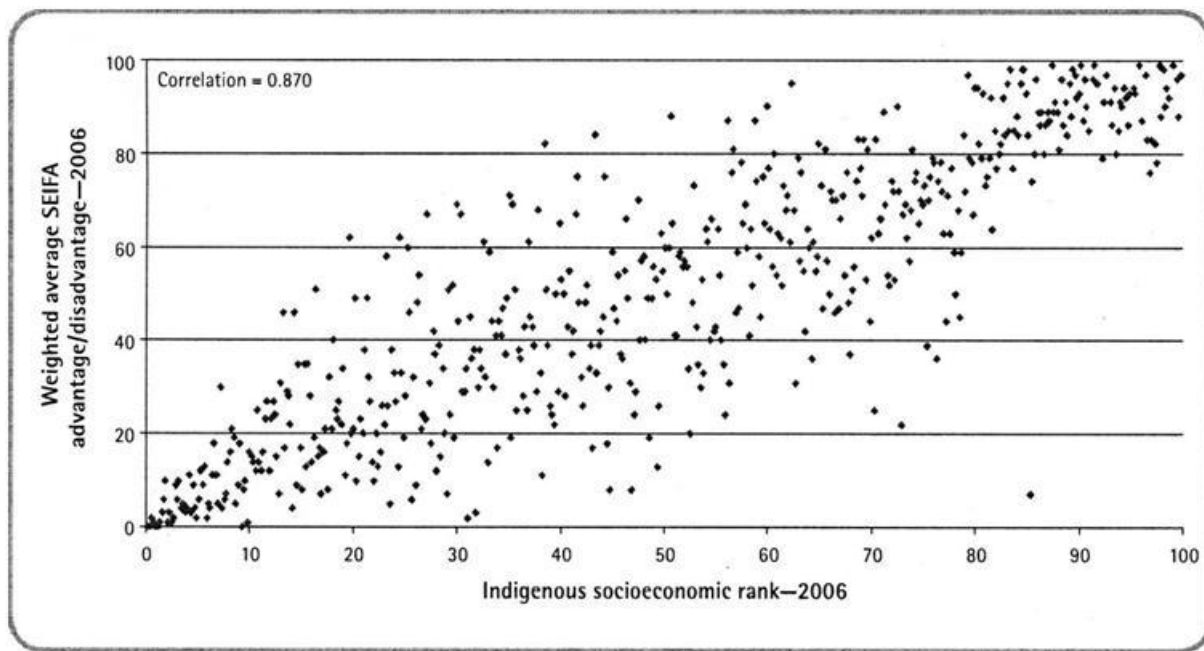
- 62 In the literature, such an issue is regarded as an **ecological fallacy** (or **ecological inference fallacy**). It can be defined as an error in the interpretation of statistical data in a study where inferences about the nature of specific individuals are based solely upon aggregate statistics collected for the group to which those individuals belong. This fallacy assumes that individual members of a group have the *average* characteristics of the group at large, and assumes that groups are homogeneous.
- 63 Work undertaken by the ABS for the Queensland Treasury in 2004<sup>2</sup> found that using SEIFA can be misleading and grossly underestimate the level of indigenous disadvantage. Stratifying SEIFA scores by Indigenous and non-Indigenous households showed that indigenous populations suffered a higher level of disadvantage regardless of whether they lived in high or low SES areas.
- 64 Within an area of given socio-economic status, Indigenous people will tend to be the more disadvantaged and non-indigenous people less so. It would be inappropriate to assume that Indigenous people in a high SES area are better off than non-Indigenous people in a low SES area. However, Figure 6 does indicate that Indigenous people in low SES areas are generally of lower SES than Indigenous people in high SEIFA value areas, despite Indigenous people making relatively little contribution to the SEIFA scores of most areas.
- 65 The Indigenous areas used in the study are large and therefore more heterogeneous. If this analysis had have been at a finer geographic level, an even better relationship could be expected.

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<sup>1</sup> Since 2002, COAG has asked the Productivity Commission to produce biennial reports on key indicators of indigenous disadvantage, the last report was released in 2009.

<sup>2</sup> Kennedy, B. And Firman, D. (2004), *Indigenous SEIFA – revealing the ecological fallacy*, Paper prepared for the 12<sup>th</sup> Biennial Conference of the Australian Population Association, 15-17 September, Canberra.

**Figure 6** Indigenous socioeconomic rank by SEIFA advantage / disadvantage rank, Indigenous areas, 2006



Source: Biddle, N. (2009), *Ranking Regions: Revising an Index for Relative Indigenous Socioeconomic Outcomes*, CAEPR Working paper No. 50/2009

66 Staff consider that using SEIFA as part of a cross classified matrix, as we do, means that we are not subject to ecological fallacy concerns. We are merely using SEIFA to distinguish between more or less disadvantaged people within the Indigenous and non-Indigenous populations. Staff consider this to be an appropriate statistical technique.

### Recommendations

Staff intend to recommend that the Commission

- conclude that SEIFA is a reliable measure of the differences between States in their socio-economic mixture, and that our current use of SEIFA is appropriate.

### WHERE TO FROM HERE

67 A version of this paper will be presented to the Commission in October. Based on State comments received by Friday August 31 2012, we may change that version.

68 Based on Commission decisions following that paper, we will gather data to build assessments or examine issues.

## ATTACHMENT A: WHICH SEIFA INDEX

- 1 Within this paper, we have used the SEIFA index of relative socio-economic disadvantage, as the sole SEIFA index examined. If the Commission does decide to continue the use of SEIFA, it must also consider which SEIFA index is the most appropriate to our purposes.
- 2 The ABS produces for SEIFA indexes, which measure slightly different concepts of socio-economic status, and are appropriate to slightly different research questions.
  - **Index of Relative Socio-economic Disadvantage (IRSD):** focuses primarily on disadvantage, and is derived from Census variables like low income, low educational attainment, unemployment, and dwellings without motor vehicles. This is the measure we have used since the 2010 review.
  - **Index of Relative Socio-economic Advantage and Disadvantage (IRSAD):** is a continuum of advantage (high values) to disadvantage (low values), and is derived from Census variables related to both advantage and disadvantage.
  - **Index of Economic Resources (IER):** focuses on financial aspects of advantage and disadvantage, using Census variables relating to residents' incomes, housing expenditure and assets.
  - **Index of Education and Occupation (IEO):** includes Census variables relating to the educational attainment, employment and vocational skills.
- 3 Neither the Index of economic resources or the index of education and occupation proxy the types of disadvantage that appear to drive State service use. However, there is some evidence that, particularly in health, socio-economic gradients exist across the spectrum. That is, the upper class or most wealthy have better health outcomes than the upper middle classes, who in turn have better health outcomes than the middle class and so on. This suggests that a measure such as IRSAD may be appropriate for such a purpose.

### Relationship between IRSAD and IRSD

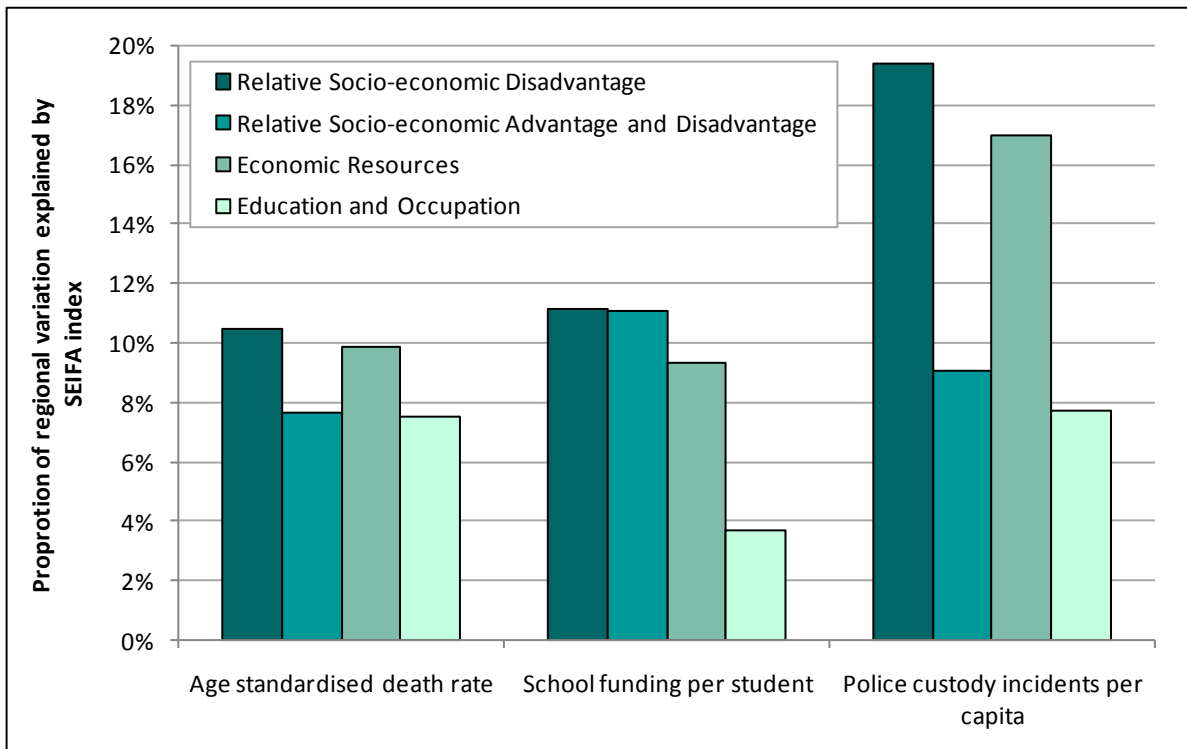
- 4 While 80% of the population live in areas where the IRSD percentile is within 10 percentage points of the IRSAD percentile, reflecting that both measures are relatively similar, and are capturing similar concepts.
- 5 However, there are some areas where the differences are larger. Certain inner city areas, particularly in Sydney and Melbourne have significant amounts of disadvantage. However, as they are gentrified, they also have significant numbers of people with very high levels of education, income etc. IRSD indicates that there are high levels of disadvantage and so gives the area a low SES score. IRSAD considers that this is offset by the high socio-economic status of some groups within the area.

- 6 Certain rural farming communities score have very few unemployed, Indigenous or people without cars, and so show up as among the least disadvantaged communities in the country. However, they also have relatively few people with higher post-school qualifications, or with high incomes or working as professionals, making these mid ranged areas being neither most disadvantaged nor most advantaged.
- 7 Staff consider that IRSD is probably a better measure of demand for State services, particularly on the basis of the inner city example. The disadvantaged in these areas are likely to require State services.

**Relationship between SEIFA and service use**

- 8 For two categories, data has been gathered which enables us to analysis which SEIFA index is most closely related to service use. These are police custody incidents, and school funding. In addition to this, we have a measure of age standardised death rates, which may be a proxy of health service use. For all three of these measures, IRSD produces the most powerful correlation, suggesting that it is the best index at explaining the socio-demographic drivers of service use.

**Figure A7 Proportion of regional variation in service use explained by different SEIFA indexes**



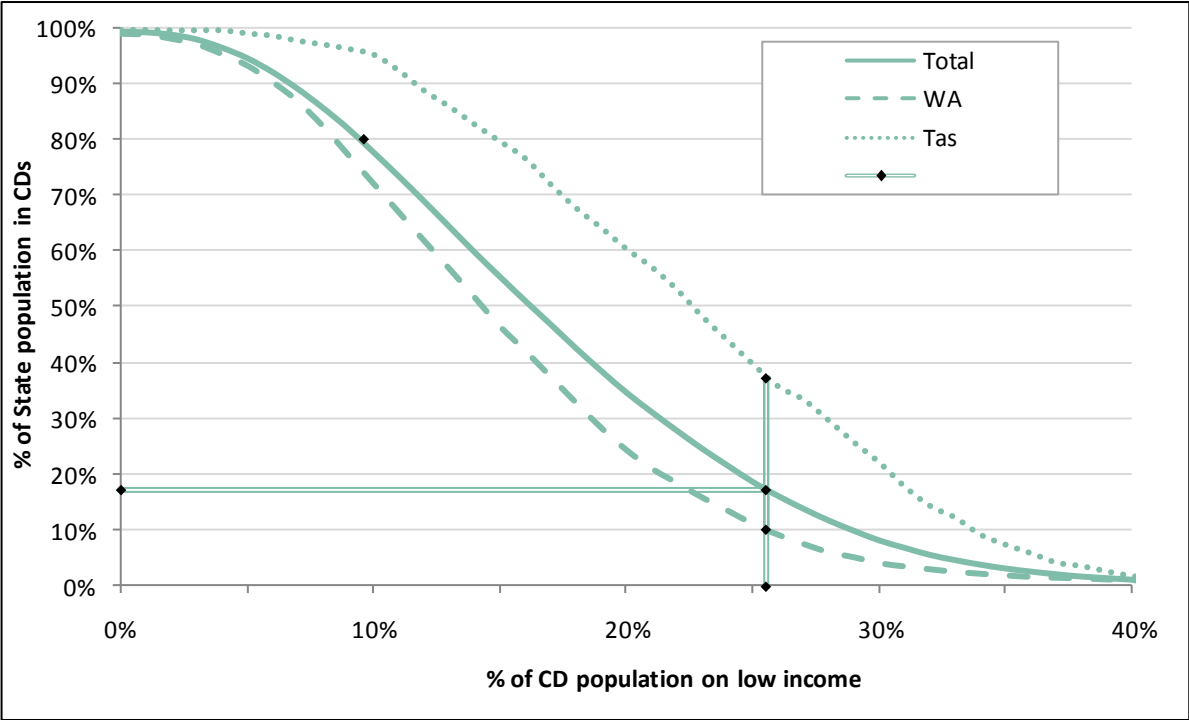
## ATTACHMENT B: MEASURING THE ELECTORAL CONUNDRUM

- 9 To measure whether SEIFA, as a geographic measure, appropriately measures the interstate shares of disadvantaged people, we need find an indicator which can be measured at both the individual level as well as at the CD level. In this example, we have chosen low income<sup>3</sup>.
- 10 Nationally 17% of the population are in low income households, and this rate varies from 8% in the ACT to 23% in Tasmania. This is our individual level indicator of income.
- 11 The geographic measure of low income is the proportion of the population living in CDs with high levels of low income. We calculate the proportion of the population in each CD with low income, and rank them from lowest to highest. This is shown in Figure B8, where nationally 80% of the population live in CDs where more than 10% of people have low incomes.
- 12 Just as 17% of the population have low income, we want our geographic measure to also capture 17% of the population. So we find that 17% of the population live in CDs where more than 26% of people have low incomes, this is shown as the hollow lines.
- 13 So while nationally, 17% of the population live in what we can now call 'low income CDs' (those CDs where more than 26% of people have low incomes), this proportion varies between States. Only 10% of Western Australians live in low income CDs, while 37% of Tasmanians do (See **Error! Reference source not found.**).

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1 The second to third decile income range of equivalised household income.

**Figure B8 Population share by prevalence of low income people in CDs, Selected States**



**Figure B9 Personal and geographic measures of prevalence of low income**

